Section 21
Hazardous Waste Site Operations

21.1 **Scope**

The requirements of this section apply to personnel and operations involved in investigation and remediation efforts associated with improperly disposed of hazardous, toxic, and/or radioactive wastes on Reclamation properties. Operations required by local, State, or Federal agencies will be conducted according to these standards. Voluntary (nonemergency) cleanup operations associated with classified hazardous wastes which may have environmental impact or public exposure fall within the scope of this standard. This section does not apply to activities involving the generation and collection of hazardous wastes which are being temporarily stored prior to proper disposal.

21.2 **Hazardous Waste Operations Safety and Health Program**

A written program will be immediately available, indicating the specific chain of command, roles, responsibilities, and authorities that govern hazardous waste operations falling within the scope of this standard. The program will reflect the necessary interface between general program and site-specific activities. A written program will exist at each organizational level where management wishes to exert consistent implementation of administrative procedures for specific hazardous waste site operations.

21.2.1 The program will designate, in writing, a program manager who will have the responsibility and authority to direct all hazardous waste operations within the scope of this section.

21.2.2 Each project that falls under the general category of "hazardous waste operation" will have a comprehensive work plan, as well as a site-specific safety and health plan, in place prior to commencing operations.

21.2.3 The written program, work plan, and site-specific safety and health plan will specify the means to implement the requirements of these standards.

21.3 **Work Plan**

Each facility, site, or project will have a written work plan that reflects the current status of site characterization/analysis and the proposed objectives and tasks.

21.3.1 The plan will identify the personnel requirements and methods to accomplish the identified tasks and objectives.

21.3.2 For uncontrolled hazardous waste sites, characteristics such as location, size, boundaries, topography, accessibility, contaminant concentrations, and contaminant dispersion pathways must be included.

21.3.3 The plan must specify the means for providing required information to employees, contractors, and others who enter the site.

21.3.4 The plan must include the requirements for training, medical evaluations, and record-keeping not specified in site-specific documents.

21.4 **Site-Specific Health and Safety Plan (HASP)**

A HASP will be available to all employees at the worksite, which is inclusive of all organizations/firms/activities at the site.

21.4.1 The plan must include a risk assessment for each identified hazard and associated task in the work plan and specify the requirements and procedures necessary to protect personnel according to all applicable standards.

21.4.2 The plan must indicate specific expectations for meeting the standards, including programs for inspection, training, medical evaluation, contaminant/exposure monitoring, site control, decontamination, personal protective equipment (PPE), emergency response, confined space entry, and spill containment requirements associated with site operations.

21.5 **Hazard Evaluation and Control**

21.5.1 Evaluation of the site and operations will be conducted to identify the specific hazards and determine procedures appropriate for controlling exposure to those hazards.

21.5.2 Controls must be implemented prior to initiating site activities.

21.6 **Hazard Communication**

21.6.1 Personnel must be informed of all identified risks and entry/work requirements before their entry into a contaminated or restricted area and/or before starting a hazardous activity covered by the requirements of this section.

21.6.2 Briefings will be conducted at intervals necessary to ensure personnel are knowledgeable of the most current information and requirements of the site-specific HASP.

21.7 **Training**

All personnel must receive the proper training required for their assigned duties, the provisions of the program, project work plan, and HASP requirements associated with specific personnel assignments and this section.

21.7.1 Personnel are prohibited from participating in, or providing onsite supervision of, site activities unless:

a. They have been certified as having successfully completed the training requirements for their assigned duties and responsibilities, and

b. Records of required training and certification have been established and are immediately available at the activity site.

21.7.2 **Trainers.** The training must be conducted by a trainer meeting the qualifications of OSHA standards in 29 CFR 1910.120 (e)(5). Generally, trainer qualification is based upon the satisfactory completion of a training program for teaching the subject matter, or appropriate academic credentials and experience, combined with demonstrated competency in instructional skills and knowledge of the subject matter.

21.7.3 The minimum training requirements are based upon OSHA requirements contained in 29 CFR 1910.120 (e). The courses established to meet these requirements must address both time and content standards. Course content and certification must be conducted according to the guidelines in Appendix E of 29 CFR 1910.120.

a. An offsite hazardous waste orientation course with sessions totaling 40 hours, plus 24 hours of supervised onsite training, will be required of all persons who:

- Enter a site unescorted by trained site personnel
- Enter restricted areas of a site
- May be exposed to hazardous substances
- May be exposed to other health hazards of a physical or biological nature
- May be exposed to safety hazards of any kind
- Are operators of equipment used in site assessment or remediation operations
- Are required or expected to wear respiratory protection or PPE when needed

- Disturb any materials within site boundaries

- Directly supervise site employees

Each year thereafter, 8 hours of supplemental training will be provided which augments the basic knowledge provided by the core course.

b. All onsite managers and supervisors directly responsible for, or who supervise, personnel engaged in hazardous waste operations must receive an additional 8 hours of training specific to the management responsibilities associated with the program elements and site requirements.

c. All employees and their managers and supervisors working onsite who are restricted to duties that are fully characterized as nonhazardous and who are not expected to wear PPE or respond to emergencies under any circumstance must receive:

- A minimum of 24 hours of off-site training from a certifying instructor, and

- An additional 8 hours of supervised onsite guidance by an experienced person before assuming their full duties associated with the operations

Any personnel trained at this level who are reassigned to hazardous duties will be provided an additional 16 hours of training by a certifying instructor as required for the duties and hazard control measures utilized, as well as an additional 16 hours of supervised onsite guidance.

21.8 **Medical Evaluations**

Medical evaluations necessary to meet the requirements of these standards (such as respirator clearances or medical qualifications for specific hazardous jobs) must be provided before employees engage in activities requiring such services. Medical surveillance must be provided for employees exposed to or affected by site contaminants.

21.8.1 All medical services required by this standard must be rendered under the direction of a board-certified occupational health physician.

21.8.2 The evaluations must be provided in a timely manner. Timeframes for medical screening tests that may become necessary during operations will be specified in the medical surveillance plan before initiating onsite operations.

21.8.3 All employees whose exposure to contaminants exceeds permissible exposure limits for 30 days or more per year will be placed in a medical surveillance program. Medical

requirements for the respiratory protection program are separate, but may be included as part of the medical surveillance on the employee.

21.8.4 All employees who wear a respirator must be medically evaluated according to the respiratory protection requirements of these standards and 29 CFR 1910.134.

21.8.5 All employees who wear respiratory protection for 30 days or more per year must be placed in a medical surveillance program.

21.8.6 All employees who develop signs or symptoms of illness or exposure to hazardous substances, who become ill, or who are injured due to overexposure to contaminants must be placed in a medical surveillance program.

21.9 **Inspections**

Inspections will be conducted to assess the proper implementation of hazard control. Identified deficiencies and corrective actions must be documented and appropriate changes made to the plan(s) when necessary.

21.10 **Contaminant/Exposure Monitoring**

Air monitoring will be performed in a manner according to the provisions contained within these standards and as required within the program, work plan, or HASP. Minimum monitoring requirements are:

21.10.1 Upon initial site entry, representative air monitoring will be conducted to identify any Immediately Dangerous to Life and Health (IDLH) condition or potential exposure above permissible exposure limits

21.10.2. Periodic monitoring will be conducted when:

- Work begins on a different portion of the site
- Contaminants other than those previously identified are being handled
- A different type of activity is initiated
- An employees are handling leaking drums or containers, or working in areas with obvious liquid contamination
- There are indications that potentially hazardous conditions exist

21.10.3 Personal monitoring must be performed for personnel who are at high-risk, such as, but not limited to, those handling leaking drums, opening drums containing unknown or hazardous substances, conducting activities in areas with obvious liquid contamination, or during any activity where contaminated substances may be disturbed.

a. After commencing activities, personal exposure monitoring will be performed for employees likely to have the highest exposures to hazardous substances and health hazards or when the airborne concentration of hazardous substances is likely to be above permissible exposure limits.

b. A monitoring result that exceeds permissible exposure limits will be considered a representative exposure of all personnel performing similar duties on the site. The exposure will be accordingly documented until personal monitoring has been accomplished for each person performing similar duties.

21.10.4. Representative sampling will be accepted to document exposures of individuals engaged in similar activities.

21.11 **Site Control**

The site control program, as a part of the site-specific HASP, must include a site map that characterizes site work zones and identifies any established engineered site safety and health controls, specific work requirements, standard operating procedures, decontamination requirements, safe work practices, site communications including emergency plan, and provisions for medical emergency services. It will identify names of personnel responsible for site safety and health.

21.12 **Control of Worker Exposure to Hazardous Substances**

Engineering controls will be the primary means of control for occupational exposure to hazardous substances. Administrative controls, such as scheduling employee rotation as a method of controlling hazardous exposures associated with hazardous waste activities and operations, must not be used.

21.13 **Personal Protective Equipment**

PPE must be provided and used according to the provisions contained in these standards and as stipulated in the program, work plan, or HASP. PPE will be based on the performance characteristics of the equipment, relative to:

- The requirements and limitations of the site
- The task-specific conditions and duration

- The hazards and potential hazards identified at the site

21.13.1 **Personal Protective Equipment.** The PPE program, as part of the HASP, must address:

- PPE selection based on site-specific hazards
- The use and limitations of PPE
- Activity duration
- Maintenance and storage of PPE
- Decontamination and disposal of PPE
- PPE training and fitting
- Equipment donning and doffing procedures
- Procedures for inspecting equipment before, during, and after use
- Evaluation of the effectiveness of the PPE program
- Medical considerations, including work limitations due to temperature extremes or physical stress

21.13.2 When airline respirators are utilized in hazardous waste operations, an auxiliary self-contained escape air supply system will be incorporated.

21.13.3 When totally encapsulating suits are used, they must be capable of maintaining positive air pressure.

21.14 Communications

All high-risk activities such as, but not limited to, remote or unobservable operations, waste drum opening/sampling, or confined space entry must be conducted in a way that ensures constant communication between the worker and site management team.

21.15 Decontamination

Decontamination must be conducted in a way that prevents the spread of hazardous contaminants and waste beyond the boundaries of the site of operations. Decontamination will apply to equipment and personnel.

21.15.1 Procedures for all phases of decontamination will be developed, communicated to all personnel, and implemented before any employee or equipment may enter areas on a site where potential exposure to hazardous substances exists. Decontamination procedures, as a part of the site-specific HASP, will specify:

- Decontamination methods and procedures for testing and evaluating their effectiveness

- The number and layout of decontamination stations and decontamination equipment needed

- Procedures to prevent contamination of clean areas and to minimize employee contact with hazardous substances or with contaminated equipment that has contacted hazardous substances

- Procedures to take if the nonimpermeable clothing of personnel becomes wetted with hazardous substances

- Methods for disposing of contaminated clothing and equipment

- Methods for disposing of decontamination water and waste

21.15.2 All personnel leaving a contaminated area must be decontaminated; all contaminated clothing and equipment leaving a contaminated area must be appropriately disposed of or decontaminated.

21.15.3 Decontamination procedures must be monitored by the site safety and health officer to determine their effectiveness. If such procedures are found to be ineffective, site work will immediately cease and remain shut down until the situation has been corrected.

21.15.4 Decontamination must be conducted in geographic areas that minimize the exposure of uncontaminated personnel and equipment to contaminated employees or equipment.

21.15.5 All equipment and material used for decontamination must be decontaminated or disposed of properly.

21.15.6 **Decontamination of Personal Protective Equipment**

a. PPE will be decontaminated, cleaned, laundered, maintained, stored, and replaced as appropriate to maintain their effectiveness.

b. Unauthorized employees will not remove PPE from change rooms.

c. Commercial laundries or cleaning establishments that decontaminate protective clothing or equipment will be informed of the potential harmful effects of exposures to hazardous substances.

d. Where the decontamination procedure indicates the need for regular showers and change rooms outside the contaminated area, or if cleanup or removal operations will require 6 months or more to complete, showers and change rooms must be provided. If

temperature effects prevent the use of water, other effective means for cleansing must be provided and used.

21.16 **Emergency Planning**

Planning for site emergencies must be conducted before commencement of hazardous waste activities.

21.16.1 Site emergency cleaning must address all anticipated emergency situations.

21.16.2 The emergency response plan must be included in the HASP and address:

- Personnel roles, responsibilities, and lines of communication
- Emergency recognition and prevention
- Safe distances and staging areas (safety zones)
- Site security and control
- Evacuation routes and procedures
- Emergency medical treatment
- Emergency alerting and response procedures
- Critique of response and followup
- Procedures for reporting incidents to Federal, State and local governments
- Decontamination

21.16.3 The emergency response plan will be a separate section of the HASP.

21.16.4 The emergency response plan will be exercised regularly as part of the overall training program.

21.16.5 The emergency response plan will be reviewed periodically and, as necessary, amended to keep it current with new or changing site conditions or operations.

21.16.6 A personnel alarm system must be installed to notify personnel of an emergency condition, to stop work activities if necessary, to lower background noise in order to speed communications, and/or to begin emergency procedures.

21.16.7 The emergency planning must be compatible and integrated with the disaster, fire, and/or emergency response plans of local, State and Federal agencies.

21.17 **Underground Storage Tank Removal**

Hazard analysis for the removal or disposal of an underground storage tank (UST) system must address:

- Hazards of UST system contents and procedures for hazard control, including explosion prevention
- Monitoring requirements and procedures
- UST system draining, purging, and cleaning procedures
- Excavation safety requirements and procedures for blocking free-standing tanks
- Procedures and safety precautions for disassembly, removal, and disposal of system
- Spill contingency planning
- Proper handling of contaminated groundwater and soil

21.18 Handling Drums and Containers

21.18.1 Identification and Inspection

a. Prior to handling or opening a drum or other container, effort will be made to identify their contents.

b. Drums and containers will be inspected and their integrity must be ensured before moving them.

c. Drums or containers that cannot be inspected before being moved because of storage conditions (e.g., buried beneath the earth, stacked behind other drums, stacked several tiers high, in a pile, etc.) must be moved to an accessible location and inspected prior to further handling.

d. Unlabeled drums or containers will be assumed to contain hazardous substances and handled accordingly until the contents are positively identified and labeled

21.18.2 Handling Requirements

a. Before moving drums or containers, all employees exposed to the transfer operation must be warned of the potential hazards associated with the contents of the drums or containers and their handling and instructed to minimize handling as much as possible.

b. Where major spills may occur, a spill containment program must be implemented to contain and isolate the entire volume of the hazardous substance being transferred. U.S. Department of Transportation specified salvage drums or containers and suitable

quantities of proper absorbent must be kept available and used in areas where spills, leaks or ruptures may occur.

c. If drums and containers cannot be moved without rupture, leakage, or spillage must be emptied into a sound container, using a device classified for the material being transferred.

d. Subsurface exploration will be used to estimate the location and depth of buried drums or containers. Soil or covering material must be removed with utmost caution to prevent drum or container rupture.

21.18.3 **Opening Drums or Containers**

a. Where an airline respirator system is used, connections to the source of air supply must be protected from contamination and the entire system protected from physical damage.

b. Personnel not involved in opening drums or containers must be kept at a safe distance from the drums or containers being opened.

c. When personnel must work near or adjacent to drums or containers being opened, place a suitable shield that does not interfere with the work operation between the adjacent person and the drums or containers being opened to protect the employees in case of an accidental explosion.

d. Controls for drum or container opening equipment, monitoring equipment, and fire suppression equipment must be located behind the explosion-resistant barrier.

e. When there is a reasonable possibility of flammable atmospheres being present, material handling equipment and hand tools will be of a type to prevent sources of ignition (e.g., nonsparking tools).

f. Drums and containers will be opened in a manner that allows excess interior pressure to be safely relieved from a remote location. Place appropriate shielding between the employee and the drums or containers, to reduce the risk of personnel injury.

g. Personnel shall not stand upon, or work from, drums or containers.

21.18.4 **Transfer.** Material handling equipment used to transfer drums and containers must be selected, positioned, and operated to minimize sources of ignition related to the equipment from ignitable vapors released from drums or containers.

21.18.5 **Precautions.** The following precautions must be taken when drums or containers containing, or suspected of containing, shock-sensitive waste are handled.

a. All non-essential personnel must be kept a safe distance from the area of transfer.

b. Material handling equipment must be provided with explosive containment devices or protective shields to protect equipment operators from exploding containers.

c. An employee alarm system, capable of being perceived above surrounding light and noise conditions, will be used to signal the commencement and completion of explosive waste handling activities.

d. Continuous communications will be maintained between the personnel in charge of the immediate handling area and both the site safety and health officer and the command center until the handling operation is completed. Communication equipment or methods which could cause shock sensitive materials to explode will not be used.

e. Drums and containers under pressure (as evidenced by bulging or swelling) will not be moved until the cause of excess pressure is determined and appropriate containment procedures have been implemented to protect employees from explosive relief of the drum.

f. Drums and containers that contain packaged laboratory wastes will be assumed to contain shock-sensitive or explosive materials until they have been characterized.

21.18.6 **Laboratory Waste Packs.** When handling laboratory waste packs, the following precautions will be taken.

a. Laboratory wastes will be considered shock-sensitive or explosive until they have been characterized.

b. Lab packs will be opened only when necessary and then only by an individual knowledgeable in the inspection, classification, and segregation of the containers within the pack, according to the hazards of the wastes.

c. If crystalline material is noted on any container, handle the contents as a shock-sensitive waste until the contents are identified.

21.18.7 **Sampling.** Sampling of drum and container contents must be done in accordance with a sampling procedure which is included in the HASP.

21.18.8 **Shipping and Transport**

a. Drums and containers must be identified as classified prior to packaging for shipment.

b. Drum or container staging areas must be kept to the minimum number necessary to identify and classify materials safely and prepare them for transport.

c. Bulking of hazardous wastes is permitted only after a thorough characterization of the material has been completed.

21.18.9 **Tank and Vault Procedures**

a. Tanks and vaults containing hazardous substances will be handled in a manner similar to that for drum and containers, taking into consideration the size of the tank or vault.

b. Avoid entering tanks or vaults if possible. When entry is required, follow appropriate tank or vault entry procedures, as described in the HASP.